5 (2), 5 (4)

AUTHOR: Batsanov, S. S. SOV/78-4-8-4/43

TITLE: Crystallochemical Characteristics of the Trans-effect (Kristallokhimicheskaya kharakteristika transvliyaniya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 8, pp 1715 - 1727 (USSR)

ABSTRACT: This paper was presented at the All-Union Conference of Crystallochemistry (March 1957). The author first gives a survey on the results hitherto obtained in the investigation of the trans-effect in complex compounds of monovalent and tetravalent platinum, palladium and cobalt. The methods of investigation applied are then mentioned: chemical analysis, measurement of molecular refraction, of the refraction of the valence electrons (Fig 1 and Table 1), comparison of the refraction along the coordinates of the complex compound (Table 2), measurement of the changed polarizability of the substituents under the influence of the trans-effect (Table 3). Moreover, the author suggested (Refs 14,15) not to compare the absolute changes of atomic refraction but their relative portions. The ratio between the refraction of a substituent subjected to the trans-effect and the eigen value of its atomic refraction was termed

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by the author as "coefficient of mobility" (Table 4). Table 5 shows the ability of the atoms of changing their polarizability and table 6 shows the atomic distances in the complex compounds of Pt(II), Pt(IV) and Co(III). The entire material permits the determination of the mechanism of the trans-effect by new ways. The author discusses the insufficiency of the hypothesis by B. V. Nekrasov (Ref 39) and J. Chatt (Ref 40). B. V. Nekrasov explains the trans-effect by re-distribution of the charges in the central atom of the complex under the action of the dipole of the trans-active substituent. J. Chatt assumes the existence of covalence bonds in the inner sphere of the complex. In this connection the substituents with the higher trans-effect have a double bond with the central atom. The author describes a new hypothesis. He assumes intermediate bonds which contain certain charges. Figure 4 shows clouds of binding electrons of different intensity. The mutual influence exercized by the charges along the linkage coordinate leads to a weakening of the bond in the trans-position. This weakening will be the more intensive the higher is the covalence of the linkage, since in this connection the charge is intensified. The effect of the negative charge is bound to lead, according to Fajans, to a loosening of the electron shell. Moreover, an interaction of the charges over the central atom may take place only if this central atom (like Pt^{II}) has a negative (or no) charge. In the trans-effect, Pt^{II} therefore has a conductive effect, whereas the positively charged Pt^{IV} has an insulating effect. This reaction model explains clearly all phenomena of the trans-effect hitherto investigated. There are 4 figures, 6 tables, and 40 references, 36 of which are Soviet.

SUBMITTED: November 26, 1957

5 (2)

AUTHORS: Batsanov, S. S., Ruchkin, Ye. D. SOV/78-4-8-5/43

TITLE: Mixed Halides of Tetravalent Platinum (Smeshannyye galogenidy chetyrekhvalentnoy platiny)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 8, pp 1728 - 1733 (USSR)

ABSTRACT: The complex compounds of platinum have been investigated in detail, which, however, is not the case with the simple compounds of platinum. They are in general, difficultly soluble, which renders their investigation by the normal methods very difficult. On the basis of the success achieved in theoretical chemistry, however, also these compounds are now accessible. The authors base their investigations on the assumption by L. Pauling (Ref 2) on the distribution of the electron charges in the complex compounds. According to the principle of the electroneutrality which he set up, the central atom is either electrically neutral or its charge does not exceed ± 1/2. The polarity of the platinum-halogen compounds is then estimated and the charge distribution in the simple halogen compounds of platinum is computed on the basis of the electronegativities

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of Pt, F, Cl, Br and J. It follows therefrom that, in general, the metal is (except for the fluorines) negatively, and the halogens (except for F) are positively charged. The same results are obtained according to the concept of electronegativity set up by R. Sanderson (Refs 6,7). In order to examine this the reaction of the oxidising agents on the halides of divalent platinum was investigated. If a substitution takes place, then the halogen atom was negatively charged, if an addition takes place, then the negative charge was bound to be in the platinum. The reaction of PtJ_2 with Cl and Br, $PtBr_2$ with Cl and J, $PtCl_2$ with iodine was carried out. In each case new compounds of tetravalent platinum of the type PtX_2Y_2 (X,Y = halogen) were formed by the addition. The compounds PtX_2Y_2 differ from the isomeric PtY_2X_2 with respect to their physical constants. This phenomenon is termed as square-coordinate-isomerism since the difference is due to the position of the halogen atoms in the squares of the bonds or the coordinates of the bonds. The measured molar refraction of the mixed halogen compounds of tetravalent platinum is higher than the results of an additive computation. This exaltation of the refraction is explained by the trans-effect. There are 16 references, 6 of which are Soviet.

SUBMITTED: November 26, 1957

SOV/51-6-3-21/28

AUTHOR: Batsanov, S.S.

TITLE: Relationship Between Refractivity and Ionisation Potentials of Atoms (Vzaimosvyaz' refraktsiy i potentsialov ionizatsii atomov)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 3, pp 412-415, (USSR)

ABSTRACT: The author discusses the relationship between the ionisation potentials and refractivity of atoms and ions of elements of groups VI (O, S, Se, Te) and VII (F, Cl, Br, I). The following formula is deduced:

$$(\overline{\Delta R} + 5) \times (\overline{\Delta P} + 5) = 500$$

Here $\overline{\Delta R} = R_{at} - R_{+z}$ (expressed in per cent), R_{at} is the refractivity of a neutral atom, R_{+z} is the refractivity of an X^{+z} ion; $\overline{\Delta P} = P_{+z}/P_{ion}$, where P_{ion} is the total sum of the successive ionisation potentials necessary for removal of all six (Group VI) or seven (Group VII) valence

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SOV/51-6-3-21/28

Relationship Between Refractivity and Ionisation Potentials of Atoms

electrons, and P_{+z} is the sum of the ionisation potentials up to valence X^{+z}. It was found that values of $\overline{\Delta P}$ are practically the same for all elements of the same group (Table 1); the same is true for ΔR. The above hyperbolic formula was checked by using it to calculate R_{ion} (the ionic refractivity of singly and doubly charged ions). The calculated values of R_{ion} (Table 4, col.7) are compared with the values reported by Pauling (Ref.16). The latter are given in col.8 of Table 4. Good agreement was found between these two sets of values, confirming the proposed hyperbolic rule. There are 4 tables and 17 references, of which 4 are Soviet, 8 English, 3 Gérman, 1 Rumanian and 1 Chinese.

SUBMITTED: April 5, 1958

Card 2/2

5 (2), 5 (3)

AUTHORS: Batsanov, S. S., Kontsevich, M. S. SOV/79-29-6-47/72

TITLE: Reaction of Mercury Carbonate and Acetate With Halogens.I. (Vzaimodeystviye karbonata i atsetata rtuti s galogenami.I.)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 6, pp 1985-1991 (USSR)

ABSTRACT: Mercury is one of the few metals in the chemistry of which the organic and the inorganic compounds are represented to the same degree. This special property of mercury is mainly due to the covalent nature of its compounds which brings about a certain independence of its valencies. This property becomes manifest in the inorganic chemistry of mercury by the possibility of a direct affiliation of the oxidizing agent to the salts of the monovalent mercury; the previously present anions are not affected; in the twenties, Indian scientists obtained the mixed salts $Hg_2Y_nX_m$ by the direct action of the halogens. In this case X represents a halogen and Y a halogen of different type or a nitric and sulfuric acid residue (Refs 1, 2). The present paper investigates the reaction products of acetate and carbonate of the univalent mercury

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Reaction of Mercury Carbonate and Acetate With Halogens.I. SOV/79-29-6-47/72

with halogens. The investigations in this field are promising since by a variation of the oxidizing agents a whole series of compounds may be obtained from one and the same initial product. By this means the chemistry of mercury is considerably extended and the synthesis of compounds with desired certain properties is made possible. Halogenation reactions of mercury carbonate and -acetate were carried out and the following perhalides were obtained: $Hg_2CO_3Cl_4$, $Hg_2CO_3Br_5$, $Hg_2CO_3J_4$, $Hg_2(CH_3COO)_2Cl_4$, $Hg_2(CH_3COO)_2Br_5$, $Hg_2(CH_3COO)_2J_4$. The physicochemical properties of the compounds obtained were investigated. The X-ray picture of carbonate of the univalent mercury was given for the first time and the densities of the mercury carbonate and acetate were determined. There are 4 tables and 8 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: April 15, 1958

Card 2/2

BATSANOV, S.S.

Structural and chemical problems in the theory of electronegativities. Izv.Sib.otd.AN SSSR no.1:68-83 '60. (MIRA 13:7)

1. Institut neorganicheskiy khimii Sibirskogo otdeleniya AN SSSR.

(Atoms)

BATSANOV, S. S., PETROVA, I. Kh.

Mixed chalcogenides of thallium. Report No.3. Izv.Sib.otd.AN
SSSR no.7:121-123 '60. (MIRA 13:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR.
(Thallium chalcongenides)

BATSANOV, S.S.; DURAKOV, V.I.

Determination of the ionic character of bonds in molecules with the aid of overlapping integrals. Part 1. Zhur. strukt. khim. 1. no.3:353-359 S-O '60. (MIRA 14:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Chemical bonds)

BATSANOV, S.S.; MIKHAYLOV, V.A.

System of electronegativities for aqueous solutions. Zhur. strukt. khim.1 no.4:410-416 N-D '60. (MIRA 14:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

(Electronegativity)

BATSANOV, S.S.; SEREBRYANAYA, N.R.

Reaction of thallium thiocyanate and thallium azide with halogens. Izv.vys.ucheb.zav.; khim.i khim.tekh. 3 no.6:980-984 '60.
(MIRA 14:4)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova, kafedra kristallografii i kristallokhimii.
(Thallium thiocyanate) (Thallium azide) (Halogens)

S/051/60/009/002/013/013/XX
E201/E491

AUTHORS: Mazalov, L.N. and Batsanov, S.S.

TITLE: Use of the Perturbation Theory in Calculation of Ionic Refractivities of Lanthanides and Actinides

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.2, pp.264-266

TEXT: Ionic refractivities R were deduced from $R = 2.522\alpha$ where α is the electronic polarizability calculated using the perturbation theory. A formula for α was first tested on the following alkali and alkaline-earth ions: Li^+, Na^+, K^+, Rb^+, Cs^+, Be^{2+}, Mg^{2+}, Ca^{2+}, Sr^{2+} and Ba^{2+} (Table 1). The formula gave good agreement (to within 10%) with experiment. The same formula was then used to calculate α, and hence R of the following lanthanides and actinides: Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Mv (Tables 2 and 3). Good agreement (to within 2%) was obtained with the only available experimental values of R for La^{3+}, Ce^{3+} and Nd^{3+}. There are 3 tables and 10 references: 3 Soviet, 4 English, 1 German, 1 Swedish and 1 translation.

SUBMITTED: March 3, 1960

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~~5 (4)~~ 5. 4130

S/076/60/034/01/011/044
B008/B014

AUTHOR: **Batsanov, S. S.**

TITLE: Refraction of the Hydrogen Bond in Inorganic Compounds

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 1, pp 68-77 (USSR)

ABSTRACT: The present paper contains the results obtained by a study of the hydrogen bond. In the investigation the new refractometric method worked out at the kafedra kristallografii i kristallokhimii MGU (Chair of Crystallography and Crystallochemistry of Moscow State University) was applied here (Refs 1-6). Table 1 contains a comparison of data given in the above references on the molecular refractions of salts without hydrogen bonds. Table 2 indicates molecular refractions of potassium- and ammonium salts containing fluorine. The refraction method permits both a determination of the N-H...F bonds and an estimation of their energies. Table 3 contains a comparison of molecular refractions of similar acid ammonium- and potassium salts; the exaltation of refractions caused by the development of hydrogen bonds is also calculated in table 3. A comparison of electronegativities of elements having hydrogen bonds in salts with a corresponding central atom is contained

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Refraction of the Hydrogen Bond in Inorganic Compounds S/076/60/034/01/011/044
B008/B014

in table 4. As may be seen, the dependence is absolutely monotonic. Since the strength of the hydrogen bond is also proportional to the polarity of the corresponding atoms, it is obvious that the variation in the refraction of hydrogen bonds is similar to the change in their energies. Table 5 lists refractions of nitrogenous ammonium- and potassium salts. A comparison with previous refraction values of hydrogen bonds shows that they are raised considerably in the case under review. Thus, also in the case of N-H...N bonds both qualitative and quantitative conclusions may be drawn as to their nature. Table 6 contains refractions of the crystallization water according to data for crystal hydrates without hydrogen bonds. In table 7 the mean refraction value is compared with the refraction values of water, ice, and various crystal hydrates. The difference between the refractions of O-H...O and O-H...F bonds and those of O-H...N bonds is striking. A comparison of data from table 7 and those contained in tables 2, 3, and 5 shows that the refractions of similar O-H...X and N-H...X bonds are equal. Table 8 lists refractions of hydrogen bonds in crystalline hydroxides, and table 9 gives results of

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Refraction of the Hydrogen Bond in Inorganic Compounds

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spectrum- and X-ray analyses. A comparison of these data proves that the refraction values of hydrogen bonds generally increase to the same extent as their bond strength. Data indicated in table 10 confirm Fajans's assumption (for instance Ref 15) that the addition of the proton to anions of arbitrary size reduces the polarizability to one and the same relative value. The refractions of hydrogen bonds in bases, basic and acid salts as well as in acids were determined (Table 11). Several compounds were measured for the first time. Results are given in tables 12 and 13. These experiments have shown that the refractometric method permits a quantitative investigation of H-bonds. This method is equally reliable as the spectroscopic or X-ray structural analysis. Moreover, it has two essential advantages: Rapidity and simplicity regarding the quality of samples investigated. There are 13 tables and 19 references, 11 of which are Soviet.

SUBMITTED: February 15, 1958

Card 3/3

BATSANOV, S.S.

Comments on the book by W.Hückel. Zhur. fiz. khim. 34 no.4:937-938 Ap '60. (MIRA 14:5)

(Chemical bonds)
(Hückel, W.)

BATSANOV, S.S.; MAZALOV, L.N.; CHIRKOV, V.I.

Computing refractions of ions of the "non-noble" gases. Izv.Sib. otd.AN SSSR no.2:121-125 '61. (MIRA 14:3)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

(Ions)

BATSANOV, S.S.; MAZALOV, L.N.

Effect of the crystal field on the size of ino refractions.
Izv.Sib.otd.AN SSSR no.5:46-50 '61. (MIRA 14:6)
(Crystals) (Ions) (Refraction)

BATSANOV, S.S.; GOROGOTSKAYA, L.I.

Ionic refraction of neodymium. Izv. Sib. otd. AN SSSR no.7: 111-114 '61. (MIRA 14:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.
(Refractometry) (Neodymium)

BATSANOV, S.S.

Covalent metal refractions. Zhur.strukt.khim. 2 no.3:361-366 My-Je '61. (MIRA 15:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Metals) (Refractometry)

DURAKOV, V.I.; BATSANOV, S.S.

Determination of the degree of ionic bonds in molecules and radicals. Part 2. Zhur.strukt.khim. 2 no.4:456-461 Jl-Ag '61. (MIRA 14:9)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

(Chemical bonds)

BATSANOV, S.S.; ABAULINA, L.I.

Interaction of mercury halides with chalcogens. Report No.2.
Izv. Sib. otd. AN SSSR no.10:67-73 '61. (MIRA 14:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

(Mercury halides)
(Chalcogens)

BATSANOV, S.S.; PETROVA, I.Kh.

Reaction of thallium sulfide and thallium selenide with halogens. Izv.vys.ucheb.zav.;khim.i khim.tekh. 4 no.3:349-354 '61. (MIRA 14:10)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, kafedra kristallografii i kristallokhimii.

(Thallium sulfide)
(Thallium selenide)
(Halogens)

BATSANOV, S.S.; VESNIN, Yu.I.

Refraction by liquid hydrofluoric acid. Opt. i spektr. 10 no. 6:808-809 Je '61. (MIRA 14:8)
(Hydrofluoric acid--Spectra) (Refractometer)

BATSANOV, Stepan Sergeyevich

[Electronegativity of elements and chemical bonds] Elektrootritsatel'nost' elementov i khimicheskaia sviaz'. Novosibirsk, Izd-vo Sibirskogo otd-niia AN SSSR, 1962. 195 p. (MIRA 15:7)
(Chemical elements—Electric properties)
(Chemical bonds)

S/200/62/000/008/002/002
D201/D308

11.4400

AUTHOR: Batsanov, S. S.

TITLE: The charges on atoms in ferrocene and its analogs

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no. 8, 1962, 110 - 113

TEXT: The charges carried by the metallic atoms Me in π - complexes such as (a) $Me(C_5H_5)_2$, (b) $Me(C_5H_5)_3$, (c) $Me(C_6H_6)_2$, (d) $Me(C_5H_5)_2$ Cl, and (e) $Me(C_5H_5)NO_3$ were calculated by the electronegativity method (described by the author in "Elektrootritsatel'nost' elementov i khimicheskaya svyaz'", Izv. SO AN SSSR, 1962) based on the determination of the percentage ionic character of the Me-C bonds, owing to a shortage of such data. The following results were obtained (in e units): (a) Mg 1.65, Ti 1.85, Sn 0.70, Pb 0.90, V 1.45, Nb 1.65, Ta 1.65, Cr 1.25, Mo 1.25, W 1.25, Mn 1.25, Fe 0.70, Co 1.70, Ni 0.55, Ru 0.25, (Rh, Pd, Os, Ir, Pt) 0.20 each; (b) Al 1.30, Sc 1.90, (Y, La, Ce, Pr, Nd) 2.15 each (Sm, Gd, Dy, Er, Yb) 1.90 each, U 1.90, As 0.35,

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S/200/62/000/011/007/008
D204/D307

AUTHORS: Pyr'yev, M. F. and Batsanov, S. S.

TITLE: Spectral analysis of binary mixtures of the Ce-group lanthanides

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no. 11, 1962, 140-141

TEXT: The present work is concerned with the spectral analysis (between 3800 and 4500 Å) of La-Nd, Nd-Sm, and Pr-Nd chloride mixtures, in which the concentrations of one component in the other were 1 - 50%, using the ИСП-67 (ISP-67) spectrograph. The spectra were excited by a 5a a-c arc. Three standard samples were used to plot a calibration curve (linear within 5%) of ΔS versus log $\frac{c_1}{c_2}$ 100%, where $\frac{c_1}{c_2}$ is the concentration ratio of the two elements in the sample and ΔS is the difference in the degree of blackening of

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Spectral analysis of ...

S/200/62/000/011/007/008
D204/D307

the two lines on the photographic plate. Concentrations were calculated by the method of Shvangiradze (ZhAKh, 14, 562 (1959)). The mean arithmetical error of the determinations was 4 - 5%. There is 1 table.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk (Institute of Inorganic Chemistry, Siberian Branch of the AS USSR, Novosibirsk)

SUBMITTED: January 20, 1962

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Card 2/2

S/192/62/003/003/004/006
D228/D307

AUTHORS: Batsanov, S. S., Grigor'yeva, G. N. and Sokolova, N. P.

TITLE: Optical properties of rare-earth metal oxides. 1. Refractions and infrared spectra

PERIODICAL: Zhurnal strukturnoy khimii, v.3, no. 3, 1962, 339-342

TEXT: Data are cited about the refractive indices, the density indices and the IR-spectra of 15 rare-earth oxides: La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tu, Yb, Lu, and Y. All specimens were prepared from powdered oxides, calcined at 800°C. The indices cannot be used to identify individual rare-earths, since they vary in relation to a sample's mode of preparation and temperature of roasting. The IR-spectra were taken on a UR-10 spectrometer in the region 400 - 800 cm^{-1}. It is concluded that further research on the IR-spectra of rare-earth oxides, maintained at different temperatures, is necessary before the spectroscopic data can be correctly processed. There are 3 figures and 2 tables.

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S/192/62/003/003/004/006
D228/D307

Optical properties of ...

ASSOCIATION: Institut neorganicheskoy khimii CO AN SSSR (Institute of Inorganic Chemistry, Siberian Division, Academy of Sciences, USSR)

SUBMITTED: October 30, 1961

Card 2/2

BATSANOV, S.S.; BOKIY, G.B.

Possibility of studying the hydrogen bond in hydroxides according to the interatomic distances. Zhur.strukt.khim. 3 no.6:716-718 '62. (MIRA 15:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

(Hydrogen bonding) (Hydroxides)

BATSANOV, S.S.; LITVIN, Yu.A.

Interaction of cuprous thiocyanate with halogens. Izv. Sib. otd. AN SSSR no.5:49-58 '62. (MIRA 18:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

OPALOVSKIY, A.A.; KUZNETSOVA, Z.M.; BATSANOV, S.S.

Study of the system $NH_4F - MoO_3 - H_2O$. Izv. Sib. otd. AN SSSR no.9:46-53 '62. (MIRA 17:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

PYR'YEV, M.F.; BATSANOV, S.S.

Spectrum analysis of binary mixtures of lanthanides of the cerium group. Izv. Sib. otd. AN SSSR no. 11:140-141 '62. (MIRA 17:9)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

BATSANOV, S.S.; GOROGOTSKAYA, L.I.; GRIGOR'YEVA, V.S.

Mixed manganese thiocyanates. Izv. SO AN SSSR no.3 Ser. khim. nauk no.1:38-47 '63. (MIRA 16:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.
(Manganese salts) (Thiocyanates)

S/192/63/004/001/001/003
D403/D307

AUTHORS: Batsanova, L.R., Grigor'yeva, G.N. and Batsanov, S.S.

TITLE: Infrared spectra of rare earth fluorides

PERIODICAL: Zhurnal strukturnoy khimii, v. 4, no. 1, 1963, 37-42

TEXT: The present continuation of earlier work (Izv. SO AN SSSR, 2, 101, (1962)) was concerned with a comparative ir study of (a) rare earth fluorides prepared by thermal decomposition, at 600°C, of double fluorides with NH_4^+, and (b) the same specimens, heated at 10^{-4} mm Hg to 1300°C over 1 hr. Samples (a) contained only traces or no NH_3, and $\sim$ 0.01 moles H_2O. Both (a) and (b) gave identical X-ray diffraction patterns. Spectroscopic studies (carried out in the region of 2 - 25 μ with the aid of the UR-10 instrument) showed the presence of weak water bands in samples (a), displaced and broadened by O - H -- F bonding, and the presence of strong bands at 400 - 500 cm^{-1} in both (a) and (b), which were ascribed to M-F bonds (where M = lanthanon). Temperature treatment did not affect the position of M-F bands but lowered their intensity owing

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Infrared spectra ...

S/192/63/004/001/001/003
D403/D307

to a reduction of structural defects on heating. There are 2 figures and 4 tables.

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR (Institute of Inorganic Chemistry of the Siberian Branch of the AS USSR)

SUBMITTED: October 30, 1961

Card 2/2

BOKIY, G.B.; BATSANOV, S.S.

Structural aspect of transeffect. Zhur.strukt.khim. 4 no.1:80-84 Ja-F '63. (MIRA 16:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Complex compounds) (Refractometry)

BATSANOV, S.S.; VESNIN, Yu.I.

Refractometry of melts. Part 1: Nitrates of univalent cations. Zhur.strukt.khim. 4 no.1:98-100 Ja-F '63. (MIRA 16:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.
(Fused salts) (Refractometry) (Nitrates)

BATSANOV, S.S.

Ionic radii in aqueous solutions. Zhur.strukt.khim. 4 no.2:176-178
Mr-Ap '63. (MIRA 16:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR,
Novosibirsk.
(Ions) (Valence (Theoretical chemistry)) (Water)

L 10584-63 BDS RM/L

ACCESSION NR: AP3001628 S/0192/63/004/003/0387/0394

AUTHOR: Batsanov, S. S.; Gagarinskiy, Yu. V.

51
48

TITLE: Optical study of uranium tetrafluoride crystal hydrates

SOURCE: Zhurnal strukturnoy khimii, v. 4, no. 3, 1963, 387-394

TOPIC TAGS: uranium tetrafluoride, uranium tetrafluoride crystal hydrates, refractive indices, densities, infrared spectra, absorption spectra, hydrogen bond, hydrogen bonding in hydrates, infrared absorption lines, thermograms

ABSTRACT: The investigation of uranium tetrafluoride crystal hydrates is of interest not only from the theoretical point of view but from the practical side as well, since the end product of uranium separation from ores and its refinement, as well as the starting material in the production of metallic uranium and uranium hexafluoride, is uranium tetrafluoride which in many methods of production is obtained by precipitation in the hydrate form and subsequent drying or calcination. Eleven samples containing from zero to 2.5 molecules of water per formula unit were prepared either by precipitation, subsequent dehydration in vacuum, re-hydration, or dehydration in a stream of HF. Refractive indices of all the samples were determined by the immersion method to an accuracy of plus minus 0.003 and their densities

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L 10584-63

ACCESSION NR: AP3001628

2

(in toluene) by a pycnometer to within 0.01 gm/cubic cm. Using this data, the molar refractions for the Na D line were calculated. Infra-red spectra of the samples were taken from 400 to 5000 per cm using a double beam UR-10 spectrometer. Spectra of samples possessing cubic symmetry had absorption line for the hydrated water indicating hydrogen bonding, whereas samples having rhombic symmetry showed two types of absorption line, those characteristic of hydrogen bonds, and those characteristic of no hydrogen bonding. All spectra exhibited and absorption maximum at 405-430 per cm which is ascribed to transverse vibrations of the U-F bond. Thermograms of vacuum dehydration were taken for two of the samples. The data, particularly from the infra-red analysis, is interpreted to indicate that in the higher crystal hydrate, UF sub 4, 2.5 H sub 2 O, possessing rhombic symmetry, the main portion of the water is bound to the fluorine by hydrogen bonds, the rest being in the field of the uranium ion. In the lower crystal hydrate (a phase with the water composition variable from approximately 1.5 up to 2 molecules of water), possessing cubic symmetry, all the water of hydration is bound to the fluorine through hydrogen bonds. "In conclusion, the authors express gratitude to Ye. I. Khanayev for participation in the development of a method for obtaining samples and to K. F. Smirnovaya for the assistance in the infrared investigation." Orig. art. has: 3 figures and 4 tables.

Card 2/2 Inst. of Inorganic Chemistry

BATSANOV, S.S.

Remarks on IA.K. Syrkin's article "Effective charges and electronegativity." Zhur. fiz. khim. 37 no.6:1418-1422 Je '63.
(MIRA 16:7)

1. Novosibirskiy institut neorganicheskoy khimii.
(Chemical bonds)
(Syrkin, IA.K.)

BATSANOV, S.S.; SHESTAKOVA, N.A.; KHRIPIN, L.A.

Tin chalcogen chlorides. Dokl. AN SSSR 152 no.3:606-608 S '63.
(MIRA 16:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
Predstavleno akademikom I.I.Chernyayevym.

OPALOVSKIY, A.A.; BATSANOV, S.S.; KUZNETSOVA, Z.M.

Physicochemical study of the system NH_4F - WO_3 - H_2O. Izv. AN SSSR. Ser. khim. no.12:2110-2116 D '63. (MIRA 17:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

GAGARINSKIY, Yu.V.; RUCHKIN, Ye.D.; LUK'YANOVA, L.A.; KUSTOVA, G.N.;
BATSANOV, S.S.

Crystal chemical study of thorium tetrafluoride hydrates. Izv.
SO AN SSSR no.11 Ser.khim.nauk no.3:8-16 '63. (MIRA 17:3)

BATSANOV, S.S.

Atomic charges in ferrocene and its analogues. Izv. Sib. otd. AN SSSR no.8:110-113 '62. (MIRA 17:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

RUCHKIN, Ye.D.; BATSANOV, S.S.

New method of obtaining the immersion preparations from selenium-sulphur alloys. Izv. SO AN SSSR no.11 Ser.khim.nauk no.3:122-123 '63. (MIRA 17:3)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

BATSANOV, S.S.

Calculation of the ionicity of bonds in complex ions. by the method of electronegativity. Zhur. neorg. khim. 9 no.6:1323-1327 Je '63 (MIRA 17:8)

MIRONOV, K. Ya.; POPOV, A.P.; RUCHKIN, Ye.D.; BATSANOV, S.S.

Nitrates of the cerium group of rare-earth metals. Report No.1: Optical properties of nitrates hexa- and tetrahydrates. Izv. SO AN SSSR no.7 Ser. khim. nauk no.2:48-57 '64 (MIRA 18:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

L 19747-65 EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b) Pr-4/Ps-4 IJP(c)/AEDC(b)/SSD/
SSD(c)/AFWL/ASD(a)-5/RAEM(i)/RAEM(j)/ESD(gs)/ESD(t) JD/JW/JG/MLK
ACCESSION NR: AT5000427 S/0000/64/000/000/0128/0130

AUTHOR: Batsanov, S.S., Grigor'yeva, G.N., Batsanova, L.R.

TITLE: Optical study of fluorides and oxides of rare earth metals B+1

27 27

SOURCE: Sibirskoye soveshchaniye po spektroskopii. 1st, Kemerovo, 1962. Spektroskopiya; metody* i primeneniye (Spectroscopy; methods and application). Doklady, soveshchaniya. Moscow, Izd-vo Nauka, 1964, 128-130

TOPIC TAGS: spectroscopy, rare earth spectrum, rare earth fluoride, rare earth oxide, rare earth determination, oxide refractive index

ABSTRACT: Fluorides of the rare earth metals (REM) were obtained by decomposing double salts of the type $nNH_4F \cdot LnF_3$ at 600C. The samples thus obtained were optically isotropic or pseudoisotropic, whereas according to literature data they should have been anisotropic. Infrared spectra before and after high-temperature treatment showed the presence of an absorption band at 400-500 cm^{-1} whose intensity decreased after the defects were annealed. Oxides of REM can be prepared by calcining any salt, including the fluorides or oxyfluorides of lanthanides. The refractive indices of oxide samples obtained at 800C ranged from 1.8 to 2.05. As the temperature rises, the refractive indices increase, and optical anisotropy becomes more and more pronounced. Some

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L 19747-65
ACCESSION NR: AT5000427

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typical spectrograms of the oxides are shown in Fig. 1 of the Enclosure. Absorption peaks at 550-650 cm^{-1} were found. For both fluorides and oxides of REM, the following characteristics were observed: increase in refractive indices and density of the samples on heating, appearance of optical anisotropy during the process and decrease in the intensity of the absorption peak corresponding to an antisymmetrial valence vibration of the REM-F and REM-0 bonds. All these features of the optical properties of REM fluorides and oxides are attributed by the authors to the defective character of their crystal structures. Orig. art. has: 1 formula and 1 figure

ASSOCIATION: none

SUBMITTED: 09May64 ENCL: 01 SUB CODE: IC, OP

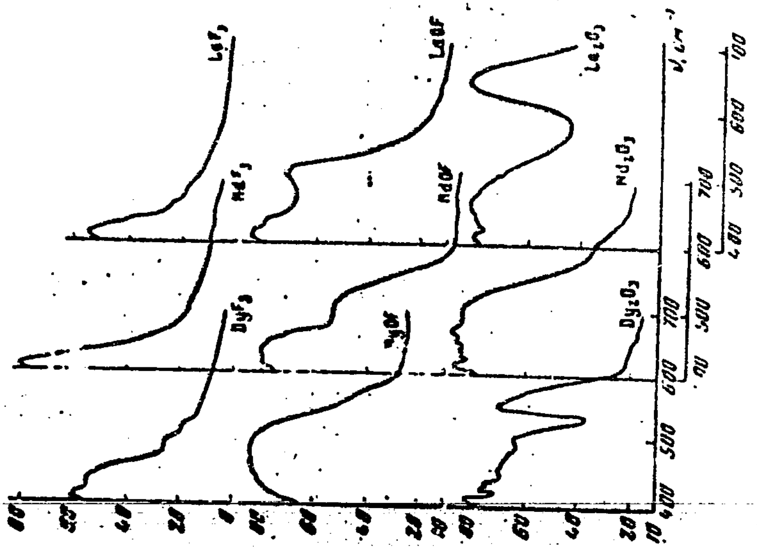
NO REF SOV: 000 OTHER: 002

Card 2/3

L 19747-65

ACCESSION NR: AT5000427 ENCLOSURE: 01

ordinate = % absorption



Card3/3

Fig. 1. Absorption spectra of the fluorides and oxides of rare-earth metals.

BATSANOV, S.S.

Geometric system of electronegativities. Zhur.strukt.khim.
5 no. 2:293-301 Mr-Ap '64. (MIRA 17:6)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

ACCESSION NR: AP4042997 S/0051/64/017/001/0149/0151

AUTHORS: Batsanov, S. S.; Derbeneva, S. S.

TITLE: Infrared spectra of strontium and lead nitrates pressed into various media

SOURCE: Optika i spektroskopiya, v. 17, no. 1, 1964, 149-151

TOPIC TAGS: ir spectrum, strontium compound, lead compound, polycrystal, absorption band, refractive index

ABSTRACT: The research was undertaken to determine the proper choice of immersion media for the investigation of the infrared spectra of polycrystalline samples, and to ascertain the dependence of the form and intensity of the absorption band on the difference between the refractive indices of the studied sample and the medium. The infrared spectra of the powdered strontium and lead nitrates were obtained with an UR-10 spectrometer in the 400--2200 cm^{-1} range.

ACCESSION NR: AP4042997

The samples were prepared by pressing 3 mg of Sr or Pb nitrate in 800 mg of KCl, KBr, KI (or CsCl), CsI, CuCl, AgCl, TlCl, and TlBr. The results show that the intensity of the valence vibration band decreases noticeably with increasing difference in the refractive indices, and not have a maximum when this difference is equal to zero, but when the immersion medium has a refractive index somewhat higher than the investigated substance. With increase in intensity, the shape of the absorption band changes in that the low-frequency skirt of the line drops systematically, while the high-frequency skirt rises. This is the result of the change in the refractive index of the substance in the absorption band. The variation in the intensity is attributed to a reduction in the background of diffuse scattering and to an increase in transmission. It is suggested that the dispersion of crystals can be determined from their infrared absorption spectra. Orig. art. has: 2 figures and 1 table.

ACCESSION NR: AP4042997

ASSOCIATION: None

SUBMITTED: 09Oct63 ENCL: 00

SUB CODE: OP, IC NR REF SOV: 000 OTHER: 002

3/3

ACCESSION NR: AP4013330 S/0020/64/154/003/0624/0626

AUTHOR: Batsanov, S. S.; Doronina, L. M.; Podberezskaya, N. V.

TITLE: Chromium chalcogenosulfides

SOURCE: AN SSSR. Doklady*, v. 154, no. 3, 1964, 624-626

TOPIC TAGS: chromium chalcogenosulfide, chromium selenide sulfide, chromium sulfide telluride, chromium sulfide, chromium oxide sulfide, chromic oxide, crystal lattice, x-ray constants, thermogram, synthesis

ABSTRACT: CrS was prepared by elemental synthesis by graduated heating from 360 to 900C. Cr_2S_2Se and Cr_2S_2Te were prepared by fusing CrS with precise amounts of Se or Te at 240 and 500C for 30 and 35 hours, respectively. Physical data (density, x-ray, thermograms) and chemical analysis established the identity and individuality of each of these compounds despite the lattices of the Se and Te compounds are similar to that of CrS. CrS, heated in air, undergoes polymorphic transition at 330C, but does not change in weight or appearance. At 580C it is

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ACCESSION NR: AP4013330

oxidized to Cr_2S_2O, and at 730C to Cr_2O_3. X-ray constants are given for all the compounds. Orig. art. has: 3 figures, 2 tables, and 3 formulas.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry, Siberian Branch, AN SSSR)

SUBMITTED: 13Aug63 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: GC NO REF SOV: 006 OTHER: 002

Card 2/2

L 22096-66 EWT(1)/T IJP(c) AT

ACC NR: AP6012958 SOURCE CODE: UR/0192/64/005/006/0927/0930

52
B

AUTHOR: Batsanov, S. S.

ORG: Institute of Inorganic Chemistry, SO, AN SSSR (Institut neorganicheskoy khimii SO AN SSSR)

TITLE: New method of calculating width of forbidden zone

SOURCE: Zhurnal strukturnoy khimii, v. 5, no. 6, 1964, 927-930

TOPIC TAGS: semiconducting material, graphite, diamond, tin, phosphorus, phosphide, carbide, forbidden zone width

ABSTRACT: A relationship is sought between ΔE (width of forbidden zone) and ΔX (difference in electronegativity) in the form

$$\Delta E_{AB} = \Delta E_a + \Delta E_b + a\Delta X_{AB} - bn_{ab},$$

where ΔE_A and ΔE_B = values of forbidden zone width for the elements A and B (in the form of simple bodies), n = average value of principal quantum number $(n_A + n_B)/2$, a and b = constants. It was emphasized that the value of ΔE of simple bodies depends on the structure of the corresponding allotropic modification and differs substantially, for example, for graphite and diamond, white and gray tin, and several other modifications. But since semiconductor compounds are of a known, ΔE of these modifications of simple bodies can be selected which would be

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L 22096-66

ACC NR: AP6012958

most suitable for a given class of compounds. For example, for the case of semiconductor phosphides ΔE can be selected for white phosphorus, and for carbides — ΔE of diamond. Tabled data includes electronegativities of metallic elements, forbidden zone width of the chalcogenides, and forbidden zone widths of phosphides, arsenides, and stibnides. The average absolute error in calculations using the author's equations is 0.2 ev for the forbidden zone width values; this figure is commensurable with usual deviations in the experimental determination of ΔE by different methods. Orig. art. has: 3 tables. [JPRS]

SUB CODE: 20 / SUBM DATE: 01Mar64 / ORIG REF: 005 / OTH REF: 007

Card 2/2 BLG

L 22535-65

ACCESSION NR: AP4048041 S/0020/64/158/006/1355/1357

AUTHOR: Batsanov, S. S.; Rigin, V. I.

TITLE: Thallium chalkogenohalides

SOURCE: AN SSSR. Doklady*, v. 158, no. 6, 1964, 1355-1357

TOPIC TAGS: thallium chalkogenohalide, thermogram, physical property, stability

ABSTRACT: Sulfur was added to TlCl, TlBr and TlI by heating in a sealed ampoule at 180C for 30 hours and cooling slowly to room temperature; selenium was added at 280C for 40 hours. The reaction products were uniform and slightly anisotropic samples. Density measurements and x rays indicated the products were new compounds and not solid solutions. The thallium chalkogenohalides were insoluble in water and organic liquids, but were decomposed by hot acid-oxidizing agents or alkali, precipitating the chalkogen. TlClS, TlBrS, TlIS, TlClSe, TlBrSe and TlISe all showed an endothermic effect at about 100C, associated with the $Tl^{III} \rightarrow Tl^{I}$ transition and two exothermic effects: at about 120C

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L 22535-65

ACCESSION NR: AP4048041

for the S and about 220C for the Se compounds, corresponding to the reduction of Tl and cleavage of the S or Se, and in the 430-460C range corresponding to the melting of the TlX. A second small endo effect in the indine-containing compound was not explained. Orig. art. has: 1 figure and 3 tables

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry, Siberian Branch, Academy of Sciences SSSR)

SUBMITTED: 12May64 ENCL: 00

SUB CODE: IC, GC NO REF SOV: 002 OTHER: 002

BATSANOV, S.S. (Novosibirsk); DERIBAS, A.A. (Novosibirsk)

Effect of an explosion on matter. Structural changes in neodymium oxide. Nauch.-tekh. probl. gor. i vzryva. no.1: 103-108 '65. (MIRA 18:9)

EWT(1)/EWP(e)/EWP(m)/EWT(m)/EWP(w)/ETC/EWG(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/
ACC NR: AP5020066 FCS(k)/EWP(b)/EWA(c)/ETC(m) IJP(c) JD/WW/JW/HW/JG
SOURCE CODE: UR/0405/65/000/002/0052/0061

AUTHOR: Batsanov, S. S. (Novosibirsk); Deribas, A. A. (Novosibirsk); Kutolin, S. A. (Novosibirsk)
44,55 44,55 44,55

ORG: none

TITLE: The action of explosion on matter. Thermodynamics of shock compression of powders
18 16 21,44,55 8 B

SOURCE: Nauchno-tekhnicheskiye problemy goreniya i vzryva, no. 2, 1965, 52-61

TOPIC TAGS: shock wave, crystallization, carbonate, shock compression, solid state physics

ABSTRACT: In previous studies, the author pointed to the possibility that superhigh pressures generated by shock waves can be used to crystallize amorphous substances or to change the atomic or electron structure of matter. In the present study, the thermodynamic parameters in the shock compression of a steel cylinder affected by the detonation of a hexogen charge were calculated and a relationship relating the kinetic energy of a steel cylinder with the size of the charge was solved by electronic computation. The results showed that for a given case the kinetic energy of the cylinder does not increase further when weight of the charge exceeds 170 g. This finding is in agreement with previous experiments which indicated that the crystallinity of neodymium oxide did not increase further when the weight of the charge was increased

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UDC: 532.593

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L 4542-66

ACC NR: AP5026066

0

above 100 g. The change in the shape of the cylinder during shock compression was determined by means of x-ray pulses. To study the behavior of carbonates under shock compression, experiments were made with $CaCO_3$, $SrCO_3$, $BaCO_3$, $CuCO_3$, and others. It was found that the carbonates dissociate into a metal oxide and carbon dioxide. From the temperature and the degree of dissociation it was calculated that the pressure in the adiabatic compression wave amounts to $(1.63-1.66)\cdot 10^5$ atm. Orig. art. has: 32 formulas and 1 figure. [PV]

SUB CODE: WA, ME/ SUBM DATE: 19Jan65/ ORIG REF: 007/ OTH REF: 001/ ATD PRESS: 4135

Card 2/2

BATSAÑOV, S.S.; PODBEREZSKAYA, N.V.; KHRIPIN, L.A.

Mercury salts with mixed anions. Report No.3: Synthesis and properties of mixed halides. Izv. AN SSSR Ser. khim. no.2: 209-213 '65. (MIRA 18:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

ACC NR: AP6011506 WW/JW/JHD

SOURCE CODE: UR/0414/65/000/004/0078/0082

AUTHOR: Batsanov, S. S. (Novosibirsk); Deribas, A. A. (Novosibirsk); Dulepov, Ye. V. (Novosibirsk); Yermakov, M. G. (Novosibirsk); Kudinov, V. M. (Novosibirsk)

ORG: none

TITLE: Effect of an explosion on a substance. Dynamic compression of potassium nitrate

SOURCE: Fizika goreniya i vzryva, no. 4, 1965, 78-82

TOPIC TAGS: explosive compression, potassium nitrate, hexogen

ABSTRACT: The explosion compression of polycrystalline KNO_3 specimens was studied to compare the effectiveness of various explosion compression techniques. The first series of experiments were conducted in the previously described (S. S. Batsanov, A. A. Deribas. Nauchno-tekhnicheskiye problemy goreniya i vzryva, 1965, 1, 103) standard steel ampoule, 5 mm in diameter and 40 mm high, in which 0.7—1.2 g samples of KNO_3 were subjected to hexogen explosions (70—150 g). The second series of experiments were carried out in a similar steel ampoule, which was attached to a massive steel plate for a rapid cooling. The third series were conducted in a device consisting of a 20-mm thick steel plate with a recess for the KNO_3 sample. A thin plate, propelled by a

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UDC: 532.593

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L 23284-66

ACC NR: AP6011506

charge toward the sample, generates a shock wave which compresses the sample; the wave then reflects from the recess bottom to relieve the pressure on the plate and thus reduce the compactness of the sample. Chemical and physical changes were studied by infrared spectrography, x-ray, and chemical analyses. No chemical changes were observed in the compression by the first and second methods; formation of metallic K was observed in the flat compression method. The density ρ, dielectric constant ε, and refractive index remain practically unchanged in the first series of experiments, but in the second series, ρ decreased from 2.106 g/cm^3 to 2.098 g/cm^3 and ε, from 4.5 to 4.2. The most significant chemical changes in the KNO_3 occurred during the flat compression experiments. The refractive index increased from 1.45 to 1.98 and ε from 4.5 to 8.5, which confirms the formation of metallic K. Spectroscopic studies indicate the appearance of chemical defects in the specimen compressed in the flat ampoule. Orig. art. has: 3 figures and 1 table. [PS]

SUB CODE: 19/ SUBM DATE: 14Jul65/ ORIG REF: 005/ OTH REF: 001/
ATD PRESS: 4230

Card 2/2 OVR

L 36985-65 EWG(j)/EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b) Pr-4/Ps-4
IJP(c) JD/JG
ACCESSION NR: AP5007755 S/0192/65/006/001/0058/0065

AUTHOR: Batsanov, S. S.; Kustova, G. N.; Ruchkin, Ye. D.; Grigor'yeva, V. S.

TITLE: Optical properties of rare earth metal oxides. 2. A polythermic study of neodymium oxide

SOURCE: Zhurnal strukturnoy khimii, v. 6, no. 1, 1965, 58-65

TOPIC TAGS: rare earth oxide, oxide optical property, neodymium oxide, polymorphic transformation, neodymium nitrate, neodymium oxalate, neodymium sulfate, neodymium coordination number, neodymium oxide structure

ABSTRACT: The [illegible] report the results [illegible] refractometric and spe[illegible] [illegible]

the [illegible]

[illegible]

nitrate at 80[illegible]

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L 36385-65
ACCESSION NR AP5007755

appeared at [illegible] the experimental conditions no B form was detected. Re- [illegible]

[illegible]

structure. Orig. art. has: [illegible] figures [illegible]

Card 2/3

EWP(e)/EWT(m)/EPF(c)/EWP(i)/EPF(n)-2/EWG(m)/EPR/T/EWP(t)/EWP(k)/
L 53915-65 EWP(e)/EWT(m)/EPF(c)/EWP(i)/EPF(n)-2/EWG(m)/EPR/T/EWP(t)/EWP(k)/ IJP(c) JD/JG/AT/WH
EWP(z)/EWP(b)/EWA(c) Pf-4/Pr-4/Ps-4/Pu-4
ACCESSION NR: AP5011826 UR/0192/65/006/002/0227/0232
541.66

AUTHOR: Batsanov, S. S.; Blokhina, G. Ye.; Deribas, A. A.

TITLE: Effect of explosions on matter. Structural changes in boron nitride 21 21

SOURCE: Zhurnal strukturnoy khimii, v. 6, no. 2, 1965, 227-232

TOPIC TAGS: boron nitride, nitride crystal structure, crystal shock compression, hexogen explosion, powdered nitride compression, electron polarizability, valence electron migration

ABSTRACT: The article discusses the results of the shock compression of powdered boron nitride BN consisting of very fine, imperfect crystals and an amorphous mass. The explosive used was hexogen. Refractometric, spectroscopic, and x-ray diffraction analyses of the product showed that the degree of crystallinity increases with the explosive force, no chemical change being observed. As a result of the action of the maximum explosive force, in addition to an ordering in the bulk of the substance, a small quantity of small, well-formed crystals (a few tenths of a millimeter long) appears having a refractive index of 1.5 ± 0.01, a density of 2.55 ± 0.05 g/cm^3, a specific infrared spectrum and an x-ray

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L 53915-65

ACCESSION NR: AP5011826

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diffraction pattern . This new modification was termed the E form. A characteristic feature of E-BN is a reduced electron polarizability, which can be caused only by a change in the electronic structure of the crystal; part of the valence electrons are thought to have migrated into the deeper layers of the atoms. "In conclusion, the authors express their thanks to T. S. Sobolenko and V. S. Zakharov for assistance in the work and to academician M. A. Lavrent'yev for interest in this investigation." Orig. art. has: 2 figures and 4 tables.

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR (Institute of Inorganic Chemistry, SO AN SSSR); Institut gidrodinamiki SO AN SSSR (Institute of Hydrodynamics, SO AN SSSR)

SUBMITTED: 22Sep64 ENCL: 00 SUB CODE: IC, WA

NO REF SOV: 005 OTHER: 003

Card 2/2

L 53912-65 EWG(j)/EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b) Pr-4/Ps-4 IJP(c) JD/JG
ACCESSION NR: AP5011827 UR/0192/65/006/002/0310/0313
541.65

AUTHOR: Batsanov, S. S.; Obzherina, K. F.; Ruchkin, Ye. D.

TITLE: Optical properties of rare earth oxides. Part 3. Polythermal study of europium and erbium oxides

SOURCE: Zhurnal strukturnoy khimii, v. 6, no. 2, 1965, 310-313

TOPIC TAGS: rare earth oxide, europium oxide, erbium oxide, oxide optical property, infrared absorption spectrum, rare earth oxalate, polycrystalline oxide

ABSTRACT: The oxalates $Eu_2(C_2O_4)_3 \cdot 10H_2O$ and $Er_2(C_2O_4)_3 \cdot 10H_2O$ were the subject of a polythermal study. Infrared spectra of these compounds and of the hydrates $Eu_2(C_2O_4)_3 \cdot 3.5\ H_2O$ and $Er_2(C_2O_4)_3 \cdot 3.1\ H_2O$ obtained by raising the temperature from 50 to 150C in a vacuum desiccator showed that, in erbium oxalate, the removal of the water is associated with a strengthening of the hydrogen bonds between the oxalate ion and the remaining watermolecules, as indicated by a shift of the stretching vibration band of the O-H bond toward longer waves. The compounds were heated further, and refractometric and infrared measurements were

L 53912-65

ACCESSION NR: AP5011827

made. At 700-800C, the bands at 1300-1500 cm^{-1} corresponding to the C-O bond disappeared. The contour of the ν_3 band (Eu-O) in the sample fired at 1200C differed markedly from the spectra of samples heated at lower temperatures. After the rare earth oxide has formed, i.e., starting at 500C, a certain change in the intensity of the principal absorption band takes place. At 900-1200C, the intensity of the absorption band remains practically unchanged, decreases by 6-7% on heating to 1350C, and sharply declines in fused samples. The reason for this intensity change is thought to be a decrease in the number of defects associated with the heating of polycrystalline rare earth oxides obtained by decomposing a more complex salt. The single crystal has the smallest number of defects and a minimum intensity of the band of the antisymmetrical stretching vibration. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR (Institute of Inorganic Chemistry, SO AN SSSR)

SUBMITTED: 10Aug64 ENCL: 00 SUB CODE: IC, OP

NO REF SOV: 005 OTHER: 006

Card 2/2

VESNIN, Yu.I.; BATSANOV, S.S.

Refractometry of melts. Part 2: Univalent cation halides.
Zhur. strukt. khim. 6 no. 4:522-526 Jl-Ag '65 (MIRA 19:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, g. Novosibirsk. Submitted February 10, 1964.

L 52782-65 EWG(j)/EWT(1)/EPA(s)-2/EWT(m)/EPF(c)/EPR/EEC(t)/EWP(t)/EWP(b)
Pr-4/Ps-4/Pt-7/Pl-4 IJP(c) JD/JG/GG

ACCESSION NR: AP5010744 UR/0181/65/007/004/1239/1241

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50
B

AUTHOR: Batsanov S. S.; Dulepov, Ye. V.

TITLE: Dielectric constants and charges of atoms in oxides of rare-earth metals

21 27 27

SOURCE: Fizika tverdogo tela, v. 7, no. 4, 1965, 1239-1241

TOPIC TAGS: rare earth metal, oxide, dielectric constant, atomic charge

ABSTRACT: The purpose of the investigation was to determine, using the equation of Szigeti (Trans. Faraday Soc. 45, 155, 1949), the effective charges at the atoms in oxides of rare-earth elements. Knowledge of the dielectric constant makes it possible to obtain additional information on the nature of the chemical bond in these oxides. The measurements were made by an immersion method, using a procedure described by M. M. Yashin (Izv. Sektora platiny IONKh AN SSSR, v. 18, 77, 1945), except that the measuring instrument was a standard E9-4 Q-meter. The results of the measurements of the dielectric constants are as follows:

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L 52782-65
ACCESSION NR: AP5010744

La_2O_3	CeO_2	Nd_2O_3	Sm_2O_3	Eu_2O_3	Gd_2O_3	Dy_2O_3	Ho_2O_3	Er_2O_3	Tm_2O_3	YbO_3	Lu_2O_3	Y_2O_3
20.8	21.2	19.7	18.4	10.2	11.4	12.1	12.3	12.5	12.6	12.6	12.9	14.0

The effective charges calculated by the Szigeti method are found to be in agreement with the effective charges calculated by the electronegativity method. Orig. art. has: 2 formulas and 2 tables.

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR, Novosibirsk (Institute of Inorganic Chemistry, SO AN SSSR)

SUBMITTED: 05Nov64 ENCL: 00 SUB CODE: SS, IC

NR REF SOV: 003 OTHER: 003

BAB
Card 2/2

OPALOVSKIY, A.A.; BATSANOV, S.S.; KUZNETSOVA, Z.M.

Physicochemical investigation of solid phases of the system $NH_4F - UO_3 - H_2O$. Radiokhimiia 7 no.5:589-596 '65. (MIRA 18:10)

L 61079-65 EWP(e)/EWP(m)/EWP(b)/T/EWP(t) Pc-4 IJP(c) RM/JD

ACCESSION NR: AP5018254 UR/0078/65/010/007/1742/1744

546.683'131'221+546.683'231

AUTHOR: Rigin, V. I.; Batsanov, S. S.

TITLE: Thallium tetrachlorosulfide and thallium tetrachloroselenide

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 7, 1965, 1742-1744

TOPIC TAGS: thallium^{27} compound, sulfur compound, selenium compound, chlorosulfide, chloroselenide

ABSTRACT: The thermal behavior of $TlClS$ and $TlClSe$ was investigated. After heating for 8 hr. at 500C, the residue was found to be Tl_4Cl_4S and Tl_4Cl_4Se. The reaction is

$$4TlClY \rightarrow Tl_4Cl_4Y + 3Y, \text{ where } Y = S \text{ or } Se.$$

When the products Tl_4Cl_4Y were heated to 650-700C, distillation took place, but no decomposition. The physicochemical properties of these products were studied. Thermographic data showed that the chalcogen had reacted with thallium chloride and is chemically combined in the samples studied. The true molar volumes of

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ACCESSION NR: AP5018254

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both compounds were determined, and the absence of solid solutions was observed. X-ray data for the interplanar distances and line intensities of Tl_4Cl_4S and Tl_4Cl_4Se are very specific and do not represent a combination of the lines of TlCl, TlClS, TlClSe, selenium, or sulfur. Thus, the X-ray data also indicate that the products formed are pure chemical compounds. The electrical conductivity of the latter was measured, and n-type conduction was found. It is postulated that the compounds are complex ones: $Tl_3/TlCl_4S/$ and $Tl_3/TlCl_4Se/$. Orig. art. has: 1 table and 1 formula.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (Institute of Inorganic Chemistry, Siberian Branch, AN SSSR)

SUBMITTED: 08Jun64 ENCL: 00 SUB CODE: IC

NO REF SOV: 002 OTHER: 000

KC

Card 2/2

BATSANOV, S.S.; RUCHKIN, Ye.D.

Isomerism of mixed platinum halides. Zhur.neorg.khim. 10 no.12:2602-2605 D '65. (MIRA 19:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

[illegible] [illegible] /EWA(h)/EWA(b)/EEC(b)-2 Pi-4 IJP(c) JD

ACCESSION NR: AP5011112 UR/0051/65/018/004/0599/0602
535.34-15

13

AUTHOR: Batsanov, S. S.; Derbeneva, S. S.

TITLE: Infrared spectra of anisotropic carbonates pressed in various media

21 27

SOURCE: Optika i spektroskopiya, v. 18, no. 4, 1965, 599-602

TOPIC TAGS: ir spectrum, uniaxial crystal, absorption spectrum, anisotropic carbonate, absorption maximum

ABSTRACT: This is a continuation of earlier work by the authors (Opt. i spektr. v. 17, 149, 1964), in which it was shown that the intensity and shape of the NO_3 ion valence oscillation band depends in regular fashion on the refractive index of the medium in which the samples are contained. The present work is an extension of the research to include anisotropic carbonates. IR spectra were obtained of crystalline powders of $CaCO_3$, $PbCO_3$, and $MgCO_3$ pressed in KCl, KBr, CsCl, CsI, CuCl, AgCl, TlCl, and TlBr. The spectra were obtained with an UR-10 spectrometer. Plots of the spectra are presented and the intensity maxima are tabulated. The results show that the intensity plotted against the difference of the refractive media of the

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L 61679-65

ACCESSION NR: AP5011112

crystals and the immersion medium (Δn_0) has two maxima, one corresponding to the minimum of n_0, and the other lying in the region of the higher refractive index. These maxima are tentatively attributed to the maxima on the anomalous-dispersion curves of uniaxial crystals. Arguments in favor of this assumption are presented. The results must be taken into account in comparisons of the intensities of IR spectra of powders of different compositions. Orig. art. has: 6 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 31Mar64 ENCL: 00 SUB CODE: OP

NR REF SOV: 001 OTHER: 000

Cord 2/2

L 11659-66 EWT(m)/EWP(j)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) IJP(c)/RPL JD/WW/JW/HW/RM

ACC NR: AP6001733 SOURCE CODE: UR/0020/65/165/004/0855/0856

44,55

AUTHOR: Batsanov, S. S.; Ovsyannikova, I. A. 44,55 53 B

ORG: Institute of Inorganic Chemistry of the Siberian Department of the Academy of Sciences SSSR (Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR) 44,55

27

TITLE: X-ray determination of charge distribution in nickelcene and nickelcenium

SOURCE: AN SSSR. Doklady, v. 165, no. 4, 1965, 855-856

TOPIC TAGS: nickel compound, sandwich compound, ~~dicyclopentadienylnickel~~, x-ray spectrum, charge distribution, ~~molecular~~ orbital calculation, ~~electronegativity~~

ABSTRACT: Calculations of charge distribution in nickelcene 7 and nickelcenium by the MO method and by that of electronegativities led to divergent results. It appeared of interest to subject the problem to experimental verification. Nickelcene was furnished by another laboratory and nickelcenium triphenylborate was prepared by the authors. X-ray K-absorption spectra 21,44,55 of both compounds were taken. Analysis of the spectral data showed that the effective charges, determined by the redistribution of the valence electrons of nickel in the course of bonding, are +1.2 for nickelcene and +1.15 for nickelcenium. The experimental results show that the charge distribution values calculated from electronegativities are in better agreement with the actual values. Orig. art. has: 1 figure. [VS]

Card 1/2 UDC: 541.49+541.50

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L 11659-66

ACC NR: AP6001733

SUB CODE: 07/ SUBM DATE: 23Apr65/ ORIG REF: 008/ OTH REF: 002/

ATD PRESS: 4175

Card 2/2

L 41155-66 EWP(m)/EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) WW/JD

ACC NR: AP6020557 SOURCE CODE: UR/0414/66/000/001/0100/0104

AUTHOR: Batsanov, S. S. (Novosibirsk); Deribas, A. A. (Novosibirsk); Kutolin, S. A. (Novosibirsk); Kostyreva, I. V. (Novosibirsk)

ORG: none

54
B

TITLE: Effect of an explosion on a substance. Dynamic compression of sodium nitrate

27 27

SOURCE: Fizika goreniya i vzryva, no. 1, 1966, 100-104

TOPIC TAGS: sodium nitrate, compression shock wave, compressive stress, spectrophotometric analysis

ABSTRACT: The properties of polycrystalline sodium nitrate subjected to dynamic compression were investigated. Dynamic compression of $NaNO_3$ was accomplished by exploding 70-150 g of trimethylene trinitramine in the presence of 1.40 g of the investigated substance in a standard ampule, 5 mm in diameter and 40 mm long. After detonation and opening of the ampules the appearance of a red-brown color along the axis of the ampules was noted in all cases. A special analysis of this portion of the specimen showed the presence of up to 1% iron, consequently the red color of the crystals can be due to admixtures of iron compounds. The optical density of the specimens of sodium nitrate subjected to dynamic compression was mea-

Card 1/2 UDC: 662.215.2

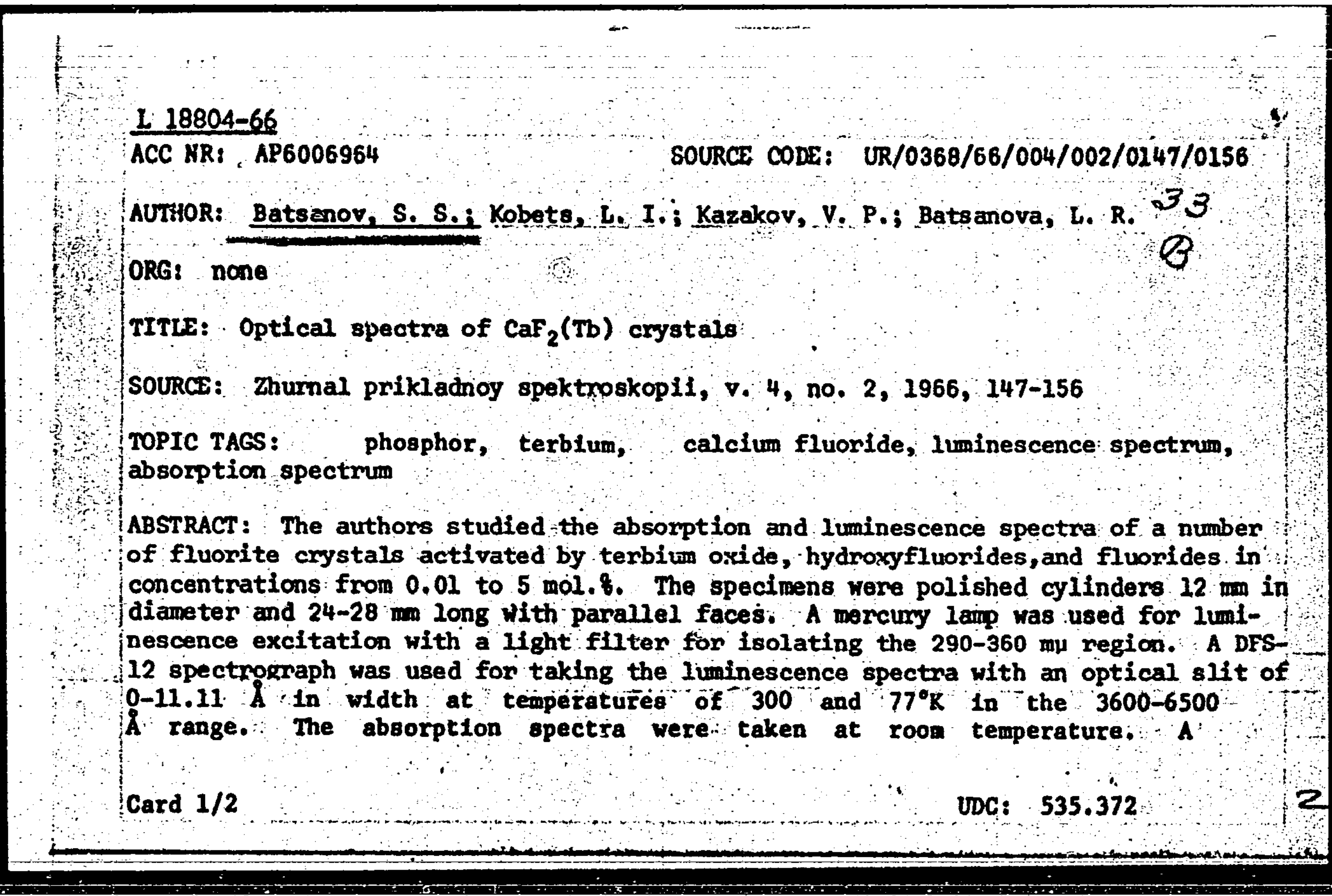
L 41155-66

ACC NR: AP6020557

sured on a spectrophotometer. The specimens were pressed into tablets (4 mg of the investigated substance per 200 mg of KBr). The red-brown color of the substance from the bottom and middle of the ampules corresponded to the gentle slope of the optical density curve in the 400—600 mμ region. No peaks characteristic for iron oxide were noted on the curve. For compressed sodium nitrate from any part of the ampule, a fine structure of the optical density spectrum in the 320—400 mμ region in the form of more than 20 peaks was characteristic. The presence of the fine structure can be explained by the development of defects in the sodium nitrate after dynamic compression. Heating of the compressed sodium nitrate at 225C for 2 hr did not change the optical density spectrum. A chemical analysis of the red-brown phase for the content of sodium and nitrogen revealed a satisfactory agreement between determinations. Sodium was determined by the flame photometry method and nitrogen by Reich's and Kjeldahl's methods with preliminary reduction of the nitrate to ammonia. The deviation of the results of the analysis from stoichiometry were within 1—2%, i.e., at the level of defects. A physical examination of the nature of the defects was not carried out, but it was assumed that the defects in the compressed sodium nitrate were formed as a result of the transfer of a charge from the nitrate ion to the sodium ion. It is concluded that as a result of the dynamic compression of $NaNO_3$ defects, electroneutral atoms, or groups of atoms of sodium occur. The hypothesis of the transport of a charge to the sodium ion is attested to by the increase of the dielectric constant: in a specimen with a density of 2.05 the dielectric constant is 8.1 as opposed to 7.1 for the original $NaNO_3$. The investigation of defects in $NaNO_3$ subject to compression will be continued. Orig. art. has: 3 tables and 3 figures.

SUB CODE: 19,20/ SUBM DATE: 28Sep65/ ORIG REF: 005/ OTH REF: 001

Card 2/2 ns



L 18804-66

ACC NR: AP6006964 SOURCE CODE: UR/0368/66/004/002/0147/0156

AUTHOR: Batsanov, S. S.; Kobets, L. I.; Kazakov, V. P.; Batsanova, L. R. 33

B

ORG: none

TITLE: Optical spectra of CaF_2(Tb) crystals

SOURCE: Zhurnal prikladnoy spektroskopii, v. 4, no. 2, 1966, 147-156

TOPIC TAGS: phosphor, terbium, calcium fluoride, luminescence spectrum, absorption spectrum

ABSTRACT: The authors studied the absorption and luminescence spectra of a number of fluorite crystals activated by terbium oxide, hydroxyfluorides, and fluorides in concentrations from 0.01 to 5 mol.%. The specimens were polished cylinders 12 mm in diameter and 24-28 mm long with parallel faces. A mercury lamp was used for luminescence excitation with a light filter for isolating the 290-360 mμ region. A DFS-12 spectrograph was used for taking the luminescence spectra with an optical slit of 0-11.11 Å in width at temperatures of 300 and 77°K in the 3600-6500 Å range. The absorption spectra were taken at room temperature. A

Card 1/2 UDC: 535.372

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ACC NR: AP6006964

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mercury lamp with a wavelength of 265 mμ isolated by a monochromator with a quartz prism was used for excitation of the specimens in measurements of the relative luminescence intensity as a function of concentration. Variations in the optical spectra are analyzed as functions of the chemical composition and concentration of the activator. The experimental data indicate that the variations in crystal spectra caused by changes in impurity concentration are due to interaction between the terbium ions forming cation pairs. It is shown that the ratio of the relative luminescence intensities of the crystals to the coefficient of absorption is a linear function of impurity concentration. The problem of interaction between an isomorphic impurity and crystal defects is discussed. "In conclusion the authors are grateful to Ye. V. Sobolev and M. V. Konovalova for assistance in the work." Orig. art. has: 3 figures, 3 tables. [14]

SUB CODE: 20/ SUBM DATE: 27Dec64/ ORIG REF: 007/ OTH REF: 015/ ATD PRESS: 4217

Card 2/2

L 42884-66 EWT(m)/EWP(j)/EWP(t)/ETI IJP(c) JD/WW/JG/RM

ACC NR: AP6020386 (A) SOURCE CODE: UR/0192/66/007/001/0122/0123

AUTHOR: Batsanov, S. S.; Kustova, G. N.

60
B

ORG: Institute of Inorganic Chemistry, SO AN SSSR, Novosibirsk (Institut neorganicheskoy khimii SO AN SSSR)

TITLE: Optical properties of rare earth oxides. Part 4: Polythermal study of neodymium acetate and hydroxide

SOURCE: Zhurnal strukturnoy khimii, v. 7, no. 1, 1966, 122-123

TOPIC TAGS: neodymium compound, IR spectrum, thermal decomposition

ABSTRACT: The formation of neodymium oxide from the acetate and hydroxide was studied by means of IR spectra. Neodymium acetate $Nd(CH_3CO_2)_3 \cdot 6H_2O$ was heated to 100, 200..., 1200°, each time to a constant weight, and its spectra were recorded. An appreciable decomposition begins at 330°, and an absorption band due to the Nd-O bond appears in the absorption spectrum at 400 cm^{-1}. The band has two humps, i. e., is characteristic of the C form of Nd_2O_3. The acetate ions are completely decomposed at 600°. The C→A transition occurs at 700°. The intensity of the 400 cm^{-1} band increases with heating and holding of the samples at 700, 800, and 900° as the content of Nd_2O_3 increases. Heating at 1000 and 1100° does not change this intensity, but after prolonged holding at 1200°, the intensity drops sharply. A similar result was obtained in a spectroscopic study of the thermal decomposition of neodymium hydroxide. At 900°, the C form

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Card 1/2 UDC: 541.65

L 42884-66

ACC NR: AP6020386

0

of Nd_2O_3 changed into the A form. Orig. art. has: 2 figures.

SUB CODE: 07/ SUBM DATE: 20Feb65/ ORIG REF: 003/ OTH REF: 001

Card 2/2

ACC NR: AP7002082 SOURCE CODE: UR/0030/66/000/012/0085/0086

AUTHOR: Batsanov, S. S. (Doctor of chemical sciences)

ORG: none

TITLE: A discussion of questions of optics and spectroscopy (All-Union Symposium in Novosibirsk)

SOURCE: AN SSSR. Vestnik, no. 12, 1966, 85-86

TOPIC TAGS: spectroscopy, scientific conference, plasma research, optics, crystal defect

ABSTRACT: A commission on spectroscopy and the Institute of Heat Physics of the Siberian Branch of the Academy of Sciences SSSR (Institut teplofiziki Sibirskogo otdeleniya Akademii nauk SSSR) conducted five All-Union symposiums on optics and spectroscopy at Akademgorodk during 5-8 September 1966. It was attended by 300 SSSR specialists. S. S. Batsanov discussed molecular spectroscopy of crystals and I. G. Yudelevich the spectral analysis of especially pure substances. There were several papers on the methods of increasing the sensitivity and precision of spectral analysis. Papers were presented on separating weak signals from fluctuating backgrounds and on concentrating microimpurities by the use of ion exchange columns. Among the papers on the behavior of atoms inside electric sparks and arcs was one

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ACC NR: AP7002082

by S. E. Frish on cascade transitions with the excitation of a mercury line spectrum. There was a special conference on plasma studies which included a presentation by S. L. Mandel'shtam on "An investigation of the laser spark" which bears on the plasma control problem. SSSR improvements in spectroscopic instrumentation were announced. Among the reports on theoretical and experimental electronic spectroscopy of solid state there were papers by V. I. Broude and S. V. Grum-Grzhimaylo. The co-workers of the Institute of Heat Physics discussed problems in optics.

SUB CODE: 20/ SUBM DATE: none

Card 2/2

BATSANOVA, L. R.

"Investigating Binary Manganese Fluorides and the Nature of their Reactions With Ammonium Fluoroberylliates." Cand Chem Sci, Moscow State U, Chair of Inorganic Chemistry, Moscow, 1954. (KL, No 4, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)

SO: SUM No. 556, 24 Jun 55

BATSANINA, A.S.